

*P.O. Box 2807  
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May 31, 2001*

Donna Weiting  
Chief, Marine Mammal Conservation Division  
Office of Protected Resources  
National Marine Fisheries Service  
1315 East-West Highway  
Silver Spring, MD 20910-3226

RE: [Docket No. 990927266-9266-01; I.D. 072699A]  
RIN 0648-AM62 Taking Marine Mammals Incidental to Navy Operations of  
Surveillance Towed Array Sensor System Low Frequency Active Sonar

Dear Ms Weiting:

To grant a "small take permit," NMFS has to find that the activity won't "take" more than a small number of marine mammals within a specified area and won't have more than a negligible impact on any particular species or stock.

The Navy has previously predicated a "small take" on the basis that a received level of 180 dB would be relatively safe: only mammals inside a 1-kilometer mitigation zone would possibly be killed or injured. This was based on a model, rather than direct tests, where whale hearing was calculated to be damaged with repeated exposure to 180-dB sound.

We now know the lethal range extends beyond a 1 kilometer because the lethal threshold is lower than 180 dB and the impact on marine mammals will be MUCH higher than projected by the Navy.

New information is available as a result of the strandings of several species of beaked whales in the Bahamas that were the direct result of a mid-frequency sonar tests. These were at exposure levels as low as 160 dB. The lower level where hemorrhaging/tissue damage occurred was apparently due to resonance in air cavities of the whales. (1,2)

It should be noted that resonance phenomena can occur with lesser energy requirements than for non-resonance. The fundamental frequency of a gas volume is that frequency at which it is most susceptible to excitation.

Such issues, calculations and mathematical modeling of potential target species are completely absent from the FEIS. Given the stringent requirements for the FEIS to make due regard to scientific process, these omissions raise grave concern about the overall accuracy and validity of the EIS.

It is the Navy's responsibility in this permitting process to ensure that the NMFS has information sufficient to make these judgments. Clearly the Navy has failed and, on this point alone, needs to withdraw or be refused a permit.

The Navy has recently argued that the two sonar systems, low- and midlevel frequency, are so different that it is entirely unfair to link the two. However, physicist Lee Tepley, PhD, and others have examined resonance buildup of low frequency SURTASS LFA signals in air cavities of mammals and concluded that this could occur for LFA frequencies at received levels as low as 160 dB. <sup>(3)</sup>

For LFAS as well as mid range sonars, Dr. Tepley shows it takes only milliseconds for the resonance to buildup in air spaces - contrary to what Joe Johnson said. Lee also calculates the perturbation of cell tissue in these air cavities; showing it is a dangerously large fraction of typical cell dimensions. For typical LFAS operation, Lee notes the cetacean may be hit by about 2000 oscillations before the frequency is changed. This can be deadly, contrary to what Mr. Johnson said.

In addition, Dr. Tepley has identified other phenomena that, like resonance, could result in mammals dying at much lower Receiving Level's than 180 dB.

Because the lethal range extends beyond a 1 kilometer mitigation area, and because the Navy's failed in it's responsibility to produce an EIS that included information needed by NMFS to make these judgments on resonance phenomena, I respectfully request that the Navy's permit for taking marine mammals incidental to Navy operations of SURTASS LFA Sonar be denied

Sincerely yours,



Marjorie Ann Erway

References

(1) Letter to Mr. Mr. J.S. Johnson, dated 2/23/2001 from Ken Balcomb.

(2) L Tepley, "Possible Mechanisms for Strandings of Beaked Whales", see <http://home1.gte.net/leetpley/lfasummary.html>

(3) ) L Tepley, "Air-space Resonances and Other Mechanisms Which May Cause Tissue Damage in Cetaceans", see <http://home1.gte.net/leetpley/lfasummary.html>

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Donna Wieting, Chief  
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1315 East-West Highway  
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Re: Docket No. 990927266-0240-02  
Low Frequency Active Sonar  
Failure to use best available mitigation technology

Dear Ms. Wieting:

The proposed rule would, if adopted, grant the Navy a "small take permit" for LFA. The law requires your agency to ensure, using all available means and methods, that the Navy's system has "the least practicable impact" on marine mammals.

The Navy did NOT employ the most sensitive mitigation technology available and the technology chosen is clearly inadequate to detect individual mammals and turtles. Within 1 kilometer of the ship the sound level can exceed the 180 dB: lethal to whatever is there. The proposed mitigation system will have an unnecessarily large impact, rather than least practicable.

Limited efficacy of proposed mitigation system

Within the FEIS section on the HF/M3 marine mammal detection system, it is stated that during testing, small cetaceans traversing the HF/M3 detection zone were only detected in 55% of cases (11 out of 20). This raises the concern that in 45% of cases, small animals may not be detected and therefore, may be exposed to injurious levels within the mitigation zone.

The Navy provided no estimate of detectability for sea turtles by the proposed mitigation system. Turtles are in real trouble because they are small and quiet. Sallie C. Beavers, a researcher who has studied ecology and aggregation of sea turtles, concludes in her written testimony, "it is indeed possible for the SURTASS LFA operations to encounter a significant portion of any sea turtle stock and possibly interfere with reproductive activities."<sup>(1)</sup>

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Better Mitigation Technology available

What about scanning sonars and more modern Synthetic Aperture/Side-Scan Sonar? What about the new "laser Camera"? These, in combination with hydro-phones, are better suited to locate cetaceans than the system planned by the Navy.

Scanning sonar sends out a sound pulse in all directions while the receiving beam is rotated rapidly to give a spiral scan presentation on a CRT screen. Synthetic Aperture/Side-Scan sonar gives higher resolution and should be able to see individual cetaceans within 1 kilometer.<sup>(2)</sup>

The newspapers have recently revealed that the Navy has an underwater "laser camera" that was used to help find flight recorders of the Egyptian Air flight 990. This is a Range Gated Imaging Sensor, coupled with a High Power Pulsed laser source. Because it operates in the visible spectrum, it can image small marine mammals and turtles at a range of 1 kilometer in clear ocean water.

Range Gated Viewers can take a single image on a CRT display or be scanned by the operator to look at a CRT display while varying the range the ocean segment being examined. The camera portion could be mounted midway down the VLA array, allowing the operator to examine the waters in any direction.

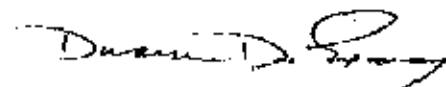
In answer to the question: Has the Navy employed the best available and practical technology was for mitigation? The answer is no. Underwater Range Gated Viewers and Synthetic Aperture Sonar, are superior to the fish finder sonar the Navy plans to use from the standpoint of detecting solitary mammals and turtles. Used in combination with hydro-phones, a reasonable detection probability would be assured.

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Recommendation

Because the Navy failed to employ the best mitigation technology, and the technology employed has demonstrated shortcomings, the permit should be denied.

Yours,



Duane D. Erway

References:

- (1) Letter to Mr. J.S. Johnson from Sallie C. Beavers, Final EIS for Surtass LFA Sonar, Volume 2, pages E-200 and E-201.
- (2) An example of side-scan sonar technology is SCAMP, an array of instruments that includes a side-scan sonar which produces high resolution images. This is mentioned in "The New Cold War", Glenn Hodges, National Geographic, Vol.197, No.3, March 2000, page 30.

PS:

I am an engineer and have personally helped develop the Range Gated Viewer systems, working for Electro-Optical Systems, Inc, under a contract with the US Navy. The system was classified "confidential" at the time .

Cc:

Representative Neil Abercrombie  
Senator Daniel Akaka  
Senator Barbara Boxer  
Senator Fritz Hollings  
Senator Daniel Inouye  
Representative Patsy Mink